



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/540,956	03/13/2006	Kumar Akhilesh Tyagi	4544-051956	5119
28289	7590	06/27/2007		
THE WEBB LAW FIRM, P.C. 700 KOPPERS BUILDING 436 SEVENTH AVENUE PITTSBURGH, PA 15219			EXAMINER KUMAR, VINOD	
			ART UNIT	PAPER NUMBER
			1638	
			MAIL DATE	DELIVERY MODE
			06/27/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/540,956	Applicant(s) TYAGI ET AL.	
	Examiner Vinod Kumar	Art Unit 1638	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on March 5, 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 35-45 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 35-45 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 June 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions.

1. Applicant's election without traverse of Group I, in the paper filed on March 5, 2007 is acknowledged. Claims 35-45 are pending and claims 35-45 are examined in this Office action.

In response to Applicant's claim amendment filed in the paper of March 5, 2007, the restriction requirement is WITHDRAWN.

Applicants are advised that if any claims including all the limitations of an allowable claim examined here are presented in a continuation or divisional application, such claims may be subject to provisional statutory and/or nonstatutory double patenting rejections over the claims of the instant application. Once the restriction requirement is withdrawn, the provisions of 35 U.S.C. 121 are no longer applicable. See *In re Ziegler*, 443 F.2d 1211, 1215, 170 USPQ 129, 131-32 (CCPA 1971). See also MPEP § 804.01.

Applicants are reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Information Disclosure Statement

2. The listing of references in the specification (pages 21-24) is not a proper

information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609.04(a) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

Priority

3. Acknowledgment is made of Applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copy of Application No. India 1317/DEL/2002, filed 12/31/2002 has been received.

Drawings

Drawings are objected to because they fail to comply with 37CFR 1.83.

4. New corrected drawings in compliance with 37 CFR 1.121(d) are required in this application because Figure 1 is a sequence that is included in the specification and sequence listing.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet,

and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

5. Claims 43-45 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claims 43-45 read on wild type seeds from a transgenic plant per se, which are found in nature and thus, are unpatentable to applicant. Given meiotic segregation during the formation of male and female gametes, and genetic reassortment and recombination following pollination leading to seed production, the claims broadly read on untransformed seeds which are product of nature. The seeds, as claimed in claims 43-45, have the same characteristics as those found naturally and therefore do not constitute patentable subject matter. See *American Wood v. Fiber Disintegrating Co.*,

90 U.S. 566 (1974), *American Fruit Growers v. Brodgex Co.*, 283 U.S. 2 (1931), *Funk Brothers Seed Co. v. Kalo Inoculant Co.*, 33 U.S. 127 (1948), *Diamond v. Chakrabarty*, 206 USPQ 193 (1980). It is suggested that claims 43-47 be amended by inserting the term --, wherein said seeds comprise the polynucleotide sequence-- at the end of claims to identify a product that is not found in nature.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 35-45 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 35 and claims dependent thereon, are incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. Claim 35 is missing the essential step of expressing the polynucleotide sequence of SEQ ID NO: 1 or variant thereof encoding the polypeptide of SEQ ID NO: 2. The last step only results in a plant transformed with the recombinant vector. Dependent claims 36-45 are also rejected because they fail to overcome this deficiency.

Claims 37-42 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite in their recitation "increased", which is a relative term lacking a comparative basis. It is suggested to insert --, relative to an untransformed plant of the same plant species-- at the end of claims.

Appropriate action/corrections are required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims are broadly drawn to a method of increasing abiotic stress tolerance in a plant, comprising transforming said plant with a recombinant vector comprising a polynucleotide sequence set forth in SEQ ID NO: 1 or a variant thereof coding for a polypeptide as shown in SEQ ID NO: 2, or wherein said plant is tobacco, rice or tomato, or wherein said transformed plant has increased tolerance to cold, drought or salt, or a transgenic plant or seed produced by said method.

Claims 35-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mukhopadhyay et al. (NCBI/EMBL Database, Sequence Accession No. AF140722, Published June 7, 2000) in view of Hiel et al. (The Plant Journal, 6:271-282, 1994) and Liu et al. (Eur. J. Biochem., 262:247-257, 1999).

Mukhopadhyay et al. teach a polynucleotide sequence isolated from rice (*Oryza sativa*) which is identical in sequence to instant SEQ ID NO: 1. The reference further teaches that said polynucleotide sequence encodes a protein which is identical in sequence to instant SEQ ID NO: 2. The reference further teaches that the protein

encoded by said polynucleotide sequence is a zinc finger protein containing zinc finger motifs. See pages 1-2.

Mukhopadhyay et al. do not teach a method of plant transformation.

Hiel et al. teach a method transforming plant (rice) cells using a plant transformation recombinant vector, and regeneration of transgenic plants (rice) from the transformed cells expressing a heterologous protein of interest. The reference also teaches transgenic seeds for obtaining transgenic progenies, such as R1 (also called T1). See in particular, page 271, summary; page 272, figure 1, table 1; page 273, figure 2; page 274, tables 2 and 3; page 275, figure 3; pages 279-280, experimental procedures.

Liu et al. teach that plant zinc finger motif containing plant proteins are involved in regulating the expression of stress-responsive genes during abiotic stresses of cold (low temperature), salt, water deficiency (drought) etc. The reference further teaches that zinc finger motif containing proteins are transcription factors which modulate expression of said abiotic stress-responsive genes through stress-responsive promoter DNA binding activity of said transcription factor(s). See in particular, abstract, page 247; page 248, table 1; page 249, Figure 3; page 251, table 2; page 252.

It would have been prima facie obvious to one skilled in the art at the time the claimed invention was made to transform any plant including an economically important crop plant, such as rice with Mukhopadhyay et al. polynucleotide sequence encoding a zinc finger motif(s) containing protein using any method of plant transformation including the rice plant transformation method taught by Hiel et al., to produce a transgenic plant

expressing Mukhopadhyay et al. zinc finger protein. Given that Liu et al. teach that zinc-finger motif containing proteins are implicated in plant's response to abiotic stresses, and abiotic stress promoters comprise DNA binding sites for zinc finger motif containing proteins, one of the ordinary skill in the art would have been motivated to overexpress Mukhopadhyay et al. polynucleotide sequence in any plant including an economically important crop plant, such as rice to produce an abiotic stress tolerant transgenic plant with reasonable expectation of success.

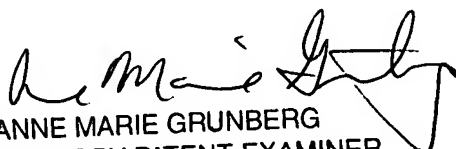
Thus, the claimed invention as a whole is prima facie obvious over the combined teachings of the prior art.

Conclusions

8. Claims 35-45 are rejected.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vinod Kumar whose telephone number is (571) 272-4445. The examiner can normally be reached on 8.30 a.m. to 5.00 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anne Marie Grunberg can be reached on (571) 272-0975. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


ANNE MARIE GRUNBERG
SUPERVISORY PATENT EXAMINER